What is claimed is:

1. A linear illumination device comprising:

a guide made of a light transmitting material extending in a first direction, having a side face and at least one end face;

light emitting means for allowing light to enter interior of the guide from the at least one end face of the guide; and

a light diffusing section formed on part of the side face of the guide, for diffusing the light incident thereon,

wherein at least part of the light entering the interior of the guide goes out from part of the side face of the guide facing the light diffusing section, thereby providing substantially linear illumination light along the first direction.

2. A linear illumination device according to claim 1, wherein the light transmitting material has a light transmittance of 80% or more (according to ASTM measuring method D1003).

3. A linear illumination device according to claim 1, wherein a refractive index of the light transmitting material is substantially in the range of 1.4 to 1.7.

4. A linear illumination device according to claim 1, wherein the light transmitting material is acrylic.

5. A linear illumination device according to claim 1, wherein the light transmitting material is polycarbonate.

6. A linear illumination device according to claim 1, wherein the guide has two end faces opposing each other, and the light emitting means includes two light emitters for allowing the light to enter the guide from the two end faces.

7. A linear illumination device according to claim 1, wherein the guide has two end faces opposing each other, and the light emitting means allows the light to enter the guide from one of the two end faces, the other end face being a mirror face or a reflective face.

8. A linear illumination device according to claim 1, wherein the light diffusing section includes a groove formed on part of the side face of the guide and a light diffusing layer provided on the groove.

9. A linear illumination device according to claim 1, wherein the light diffusing section has a rough surface.

10. A linear illumination device according to claim 9, wherein the light diffusing section has center line average roughness Ra is in the range of (100 to 0.013)a and the maximum height Rmax is in the range of (400 to 0.05)S in terms of surface roughness indicated in JIS standard B0601.

11. A linear illumination device according to claim 1, wherein a surface of the light diffusing section has a triangular wave shape or a sawtooth shape.

12. A linear illumination device according to claim 11, wherein a surface of the light diffusing section has a

triangular wave shape having a pitch in the range of 50 μm to 2000 μm and a height at a peak in the range of 20 μm to 800 μm.

13. A linear illumination device according to claim 1, wherein the light diffusing section is formed on part of the side face of the guide as one continuous part in the first direction.

14. A linear illumination device according to claim 1, wherein the light diffusing section is formed on part of the side face of the guide at intervals in the first direction.

15. A linear illumination device according to claim 1, wherein a total reflection layer is formed on the entire side face of the guide excluding the light diffusing section and part facing the light diffusing section.

16. A linear illumination device according to claim 1, wherein the light diffusing section is a diffusing layer.

17. A linear illumination device according to claim 16, wherein the diffusing layer is made of a light diffuser and a light transmitting resin.

18. A linear illumination device according to claim 17, wherein a refractive index of the light diffuser is larger than that of the guide.

19. A linear illumination device according to claim 17, wherein a refractive index of the light transmitting resin is substantially equal to that of the guide.

20. A linear illumination device according to claim 17, wherein the light diffuser is TiO_2.

21. A linear illumination device according to claim 17, wherein the light diffuser is TiO_2, and the light transmitting resin is a silicon resin.

22. A linear illumination device according to claim 1, wherein the light emitting means has at least one light emitting diode.

23. A linear illumination device according to claim 6, wherein each of the two light emitters has at least one light emitting diode.

24. A linear illumination device according to claim 1, wherein the light emitting means has a light emitting angle distribution in the range of 30 to 150 degrees.

25. A linear illumination device according to claim 6, wherein the guide has a pillar shape extending in the first direction.

26. A linear illumination device according to claim 25, wherein the light diffuser is formed in the first direction as one continuous part.

27. A linear illumination device according to claim 26, wherein a width of the light diffusing section in a second direction is constant, the second direction being perpendicular to the first direction.

28. A linear illumination device according to claim 26, wherein a width of the light diffusing section in a second direction perpendicular to the first direction gradually increases as approaching a central portion of the guide from the two end faces.

29. A linear illumination device according to claim 25, wherein the light diffusing section is formed at constant intervals in the first direction.

30. A linear illumination device according to claim 29, wherein the light diffusing section is formed in a constant shape.

31. A linear illumination device according to claim 29, wherein an area of the light diffusing section gradually increases as approaching a central portion from the two end faces.

32. A linear illumination device according to claim 25, wherein the light diffusing section is formed in the first direction at intervals, the intervals gradually decreasing as approaching a central portion from the two end faces of the guide.

33. A linear illumination device according to claim 26, wherein the light diffusing section is made of a light diffuser and a light transmitting resin.

34. A linear illumination device according to claim 26, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

35. A linear illumination device according to claim 29, wherein the light diffusing section is a diffusing layer made of a light diffuser and a light transmitting resin.

36. A linear illumination device according to claim 29, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

37. A linear illumination device according to claim 32, wherein the light diffusing layer is made of a light diffuser and a light transmitting resin.

38. A linear illumination device according to claim 32, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

39. A linear illumination device according to claim 25, wherein the guide has a polygonal pillar shape.

40. A linear illumination device according to claim 25, wherein the guide has a cylindrical shape.

41. A linear illumination device according to claim 40, wherein two planes forming a predetermined angle therebetween are provided in part of the side face of the guide facing the light diffusing section.

42. A linear illumination device according to claim 41, wherein the predetermined angle is 90 degrees.

43. A linear illumination device according to claim 40, wherein a V-shaped cut face, which has such a shape that a width and a depth in a second direction perpendicular

to the first direction gradually increase as approaching a central portion of the guide from the two end faces, is formed on the side face of the guide.

44. A linear illumination device according to claim 43, wherein the light diffusing section is formed on an entire surface or part of the V-shape cut face.

45. A linear illumination device according to claim 6, wherein the guide has such a shape that a cross-sectional area of the guide gradually decreases as approaching a central portion between the two end faces.

46. A linear illumination device according to claim 45, wherein the light diffusing section is formed in the first direction as one continuous part.

47. A linear illumination device according to claim 46, wherein a width of the light diffusing section in a second direction perpendicular to the first direction is constant.

48. A linear illumination device according to claim 46, wherein a width of the light diffusing section in a second direction perpendicular to the first direction gradually increasing as approaching a central portion of the guide between the two end faces.

49. A linear illumination device according to claim 45, wherein the light diffusing section is formed in the first direction at constant intervals.

50. A linear illumination device according to claim 49, wherein the light diffusing section is formed in a constant shape.

51. A linear illumination device according to claim 49, wherein an area of the light diffusing section gradually increases as approaching a central portion of the guide between the two end faces.

52. A linear illumination device according to claim 45, wherein the light diffusing section is formed in the first direction at intervals gradually decreasing as approaching a central portion of the guide between the two end faces.

53. A linear illumination device according to claim 46, wherein the light diffusing section is a diffusing layer made of a light diffuser and a light transmitting resin.

54. A linear illumination device according to claim 46, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

55. A linear illumination device according to claim 49, wherein the light diffusing section is made of a light diffuser and a light transmitting resin.

56. A linear illumination device according to claim 49, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

57. A linear illumination device according to claim 52, wherein the light diffusing section is made of a light

diffuser and a light transmitting resin.

58. A linear illumination device according to claim 52, further comprising a diffusing layer formed on an entire surface or part of the light diffusing section.

59. A linear illumination device according to claim 45, wherein a cross-section of the guide has a similar shape as that of each of the two end faces, and each of the two end faces has a polygonal cross-section.

60. A linear illumination device according to claim 45, wherein a cross-section of the guide has a similar shape to that of each of the two end faces, and each of the two end faces has a circular cross-section.

61. A linear illumination device according to claim 60, wherein two plane forming a predetermined angle therebetween are provided in part of the side face of the guide facing the light diffusing section.

62. A linear illumination device according to claim 61, wherein the predetermined angle is 90 degrees.

63. A linear illumination device according to claim 45, wherein the side face of the guide contains a straight line parallel to the first direction, the straight line connecting a point on a circumference of one of the end faces to a corresponding point on a circumference of the other of the end faces.

64. A linear illumination device according to claim 63, wherein the guide has a circular cross-section.

65. A linear illumination device according to claim 63, wherein part of the side face of the guide facing the light diffusing section contains the straight line, and at least part of the light beams goes out from a vicinity of the straight line.

66. A linear illumination device according to claim 65, wherein two planes forming a predetermined angle therebetween are provided in part of the side face of the guide facing the light diffusing section.

67. A linear illumination device according to claim 66, wherein the predetermined angle is 90 degrees.

68. A linear illumination device according to claim 65, wherein an area of a cross-section of a central portion of the guide is 70% or less of an area of each of the two end faces.

69. A linear illumination device according to claim 1, wherein the light emitting means emits red light, green light and blue light in a time divided manner.

70. A linear illumination device according to claim 22, wherein the light emitting means emits red light, green light and blue light in a time divided manner.

71. A linear illumination device according to claim 70, wherein the light emitting means includes three light emitting diodes respectively emitting the red light, the green light and the blue light.

72. A linear illumination device according to claim 23,

wherein the light emitting means emits red light, green light and blue light in a time divided manner.

73. A linear illumination device according to claim 72, wherein the light emitting means includes three light emitting diodes respectively emitting the red light, the green light and the blue light.

74. A direct contact type image sensor unit comprising:

an optical fiber array including a plurality of optical fibers;

a transparent plate placed so as to be in contact with the optical fiber array, which has two end faces;

a pair of opaque substrates placed so as to interpose the optical fiber array and the transparent plate therebetween;

light emitting means for allowing light to be incident on the transparent plate from one of the two end faces of the transparent plate;

a light blocking layer formed on the other of the two end faces of the transparent plate; and

a light receiving element array including a plurality of light receiving elements provided on one ends of the plurality of optical fibers,

wherein the light emitting means is a linear illumination device as claimed in claim 1 and emits linear illumination light to a document along the first direction.

75. A direct contact type image sensor unit according to claim 74, wherein each of the plurality of optical fibers has a core, a cladding layer provided on an outer surface of the core, and a light absorbing layer provided on an

outer surface of the cladding layer.

76. A direct contact type image sensor unit according to claim 74, further comprising lens means disposed between one of the two end faces of the transparent plate and the light emitting means,

wherein the lens means converges the illumination light only in a second direction perpendicular to the first direction.

77. A direct contact type image sensor unit according to claim 74, wherein the guide of the linear illumination device has two end faces, a cross-section of the guide perpendicularly crossing the first direction being similar to that of each of the two end faces, an area of the cross-section of the guide gradually decreasing as approaching a central portion from the two end faces, and

wherein the light emitting means allows the light to enter the guide from the both end faces, and the light diffusing layer is formed in the first direction as one continuous part.

78. A direct contact type image sensor unit according to claim 77, wherein a width of the light diffusing layer in a second direction perpendicular to the first direction gradually increasing as approaching the central portion between the two end faces of the guide.

79. A direct contact type image sensor unit according to claim 77, wherein a width of the light diffusing layer in a second direction perpendicular to the first direction is constant.

80. A direct contact type image sensor unit according to claim 77, wherein a side of the guide contains a straight line which is obtained by connecting corresponding points of the two end faces and substantially parallel to the first direction, a vicinity of the straight line of the side faces one of the two end faces of the transparent plate, and the illumination light is emitted from the vicinity of the straight line.

81. A direct contact type image sensor unit according to claim 77, wherein the guide has a circular cross-section.

82. A direct contact type image sensor unit according to claim 74, wherein the guide has two end faces and a pillar shape extending in the first direction and a constant shape of a cross-section perpendicularly crossing the first direction, and

wherein the light emitting means allows the light to enter interior of the guide from both two end faces, and the light diffusing layer is formed in the first direction as one continuous part.

83. A direct contact type image sensor unit according to claim 82, wherein a width in a second direction perpendicularly crossing the first direction of the light diffusing layer gradually increases as approaching a central portion of the guide between the two end faces to be maximum in the central portion.

84. A direct contact type image sensor unit according to claim 82, wherein a width in a second direction perpendicularly crossing the first direction of the light diffusing layer is constant.

85. A direct contact type image sensor unit according to claim 82, wherein a cross-section of the guide perpendicularly crossing the first direction is circular.

86. A direct contact type image sensor unit according to claim 74, wherein a refractive index of the guide of the linear illumination device is substantially equal to that of the transparent plate.

87. A direct contact type image sensor unit according to claim 74, wherein a material of the transparent plate is the same as the light transmitting material forming the guide of the linear illumination device.

88. A direct contact type image sensor unit according to claim 74, wherein the linear illumination device is connected to the transparent plate using a transparent resin having substantially the same refractive index as those of the guide and the transparent plate, while optically matching the guide and the transparent plate.

89. A direct contact type image sensor unit according to claim 76, wherein a refractive index of the lens means is substantially the same as that of the transparent plate.

90. A direct contact type image sensor unit according to claim 76, wherein the lens means and the transparent plate are made of the same material.

91. A direct contact type image sensor unit according to claim 89, wherein the lens means is connected to the transparent plate using a transparent resin having substantially the same refractive index as those of the

lens means and the transparent plate, while optically matching the lens means and the transparent plate.

92. A direct contact type image sensor unit according to claim 74, wherein the light emitting means has at least one light emitting diode.

93. A direct contact type image sensor unit according to claim 74, wherein the light emitting means has three light emitting diodes respectively emitting red light, green light and blue light.

94. A direct contact type image sensor unit according to claim 74, wherein an angle at which the illumination light from the linear illumination device is incident on the document is in the range of 0 to 50 degrees.

95. A linear illumination device comprising:

a substrate extending in a first direction;

a light emitting array provided on the substrate and arranged in the first direction; and

a fiber array plate having a plurality of groups of fibers placed so as to respectively correspond to light emitting elements of the array,

wherein light from each of the light emitting elements is incident on a side face of a corresponding group of the fibers and goes out from the other side face, thereby irradiating a document placed so as to face the light emitting element array with linear illumination light along the first direction.

~~96.~~ 2 A linear illumination device according to claim ~~95~~ 1, wherein a plurality of concavities are formed on a face of the substrate on which the light emitting array is provided, each of the light emitting elements is provided on a bottom face of a corresponding one of the concavities, and the bottom face and a side face of each of the concavities are reflective faces or mirror faces.

97. A linear illumination device for irradiating a document provided so as to face the light emitting element array with linear illumination light along a first direction, comprising:

a substrate extending in the first direction; and

a light emitting array provided on the substrate and arranged in the first direction,

wherein a plurality of concavities are formed on a face of the substrate on which the light emitting array is provided, each of the light emitting elements is provided on a bottom face of a corresponding one of the concavities, and the bottom face and a side face of each of the concavities are reflective faces or mirror faces.

98. A linear illumination device according to claim 97, further comprising a transparent plate provided on the light emitting element array,

wherein the first direction is parallel to a main scanning direction of the document, a length of the transparent plate in the main scanning direction is substantially the same as that of the light emitting element array, at least a part of the transparent plate has a length in a sub-scanning direction of the document which is substantially the same as that of each of the light emitting elements in the second direction, and a

length of the transparent plate in a direction, which is perpendicular to both the main scanning direction and the sub-scanning direction is substantially the same as a distance between the light emitting element array and the document.

99. A linear illumination device for irradiating a document provided so as to face the light emitting element array with linear illumination light along a first direction, comprising:

a substrate extending in the first direction;

a light emitting array provided on the substrate and arranged in the first direction; and

a transparent plate provided on the light emitting element array,

wherein the first direction is parallel to a main scanning direction of the document, a length of the transparent plate in the main scanning direction is substantially the same as that of the light emitting element array, at least a part of the transparent plate has a length in a sub-scanning direction of the document which is substantially the same as that of each of the light emitting elements in the second direction, and a length of the transparent plate in a direction, which is perpendicular to both the main scanning direction and the sub-scanning direction, is substantially the same as a distance between the light emitting element array and the document.

~~100.~~ A linear illumination device according to claim ~~96~~, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has an inverse cone shape having a direction perpen-

dicular to the main scanning direction and a sub-scanning direction of the document as an axis.

~~101~~ 4. A linear illumination device according to claim ~~96~~, 2 wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has an inverse ellipsoidal cone shape which has a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis and is longer in the main scanning direction.

~~102~~. 5 A linear illumination device according to claim ~~96~~, 2 wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating a parabola (quadratic curve) about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

~~103~~. 6 A linear illumination device according to claim ~~96~~, 2 wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating a parabola (quadratic curve) about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

~~104~~. 7 A linear illumination device according to claim ~~96~~, 2 wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating a cubic curve or a higher multidimensional curve about a direction perpendicular to

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the main scanning direction and a sub-scanning direction of the document as an axis.

~~105~~ 8. A linear illumination device according to claim ~~96~~ 2, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating a cubic curve or a higher multidimensional curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

~~106~~ 9. A linear illumination device according to claim ~~96~~ 2, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating an arbitrary curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

~~107~~ 10. A linear illumination device according to claim ~~96~~ 2, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating an arbitrary curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

108. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has an inverse truncated cone shape having a third direction perpendicular to the main scanning direction

and a sub-scanning direction of the document as an axis.

109. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has an inverse ellipsoidal truncated cone shape which has a third direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis and is longer in the main scanning direction.

110. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating a parabola (quadratic curve) about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

111. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating a parabola (quadratic curve) about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

112. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating a cubic curve or a higher multidimensional curve about a direction perpendicular to the main

scanning direction and a sub-scanning direction of the document as an axis.

113. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating a cubic curve or a higher multidimensional curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

114. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by circularly rotating an arbitrary curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

115. A linear illumination device according to claim 97, wherein the first direction is parallel to a main scanning direction of the document, and each of the concavities has a truncated cone shape of revolution obtained by elliptically rotating an arbitrary curve about a direction perpendicular to the main scanning direction and a sub-scanning direction of the document as an axis.

116. A linear illumination device according to claim 98, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, the first face being a triangular wave face or a sawtooth face having a first predetermined

angle and a first predetermined pitch.

117. A linear illumination device according to claim 98, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, the second face being a triangular wave face or a sawtooth face having a second predetermined angle and a second predetermined pitch.

118. A linear illumination device according to claim 116, wherein the second face is a triangular wave face or a sawtooth face having a second predetermined angle and a second predetermined pitch.

119. A linear illumination device according to claim 98, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, and part of a cross-section of the transparent plate along the sub-scanning direction, facing the second face is a curved face.

120. A linear illumination device according to claim 98, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, and a length of the transparent plate in the sub-scanning direction gradually decreases from the first face toward the second face.

121. A linear illumination device according to claim 98, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, and the transparent plate includes a first part containing the first face and having a con-

stant width in the sub-scanning direction and a second part containing the second face and having a width in the sub-scanning direction gradually decreasing in a direction away from the light emitting element array, which is further from the light emitting element array than the first part, whereby the second face forms a predetermined angle with respect to the first face.

122. A linear illumination device according to claim 98, wherein the transparent plate includes a plurality of regions having a different refractive index from that of a periphery thereof therein, thereby diffusing light from the light emitting element array incident on the transparent plate so as to emit the light as the illumination light.

123. A linear illumination device according to claim 122, wherein the plurality of regions are a plurality of cavities formed in the transparent plate.

124. A linear illumination device according to claim 123, wherein each of the plurality of cavities has a cylindrical shape having an axis in the sub-scanning direction.

125. A linear illumination device according to claim 123, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face, each of the plurality of cavities has a triangular prism shape having an axis in the sub-scanning direction, one side face of the triangular prism opposes to the first face, and an edge opposing the side face is closer to the first face than the side face.

126. A linear illumination device according to claim 99, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face opposing the first face, the first face being a triangular wave face or a sawtooth face having a first predetermined angle and a first predetermined pitch.

127. A linear illumination device according to claim 99, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face opposing the first face, the second face being a triangular wave face or a sawtooth face having a second predetermined angle and a second predetermined pitch.

128. A linear illumination device according to claim 126, wherein the second face is a triangular wave face or a sawtooth face having a second predetermined angle and a second predetermined pitch.

129. A linear illumination device according to claim 99, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face opposing the first face, part of a cross-section of the transparent plate along the sub-scanning direction is a curved face.

130. A linear illumination device according to claim 99, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face opposing the first face, and a length of the transparent plate in the sub-scanning direction gradually decreases as approaching the second face from the first face.

131. A linear illumination device according to claim 99, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face facing the first face,

wherein the transparent plate includes a first part containing the first face and having a constant width in the sub-scanning direction and a second part containing the second face and having a width in the sub-scanning direction gradually decreasing as in a direction away from the light emitting element array, which is further from the light emitting element array than the first part, whereby the second face forms a predetermined angle with respect to the first face.

132. A linear illumination device according to claim 99, wherein the transparent plate includes a plurality of regions having a different refractive index from that of a periphery thereof therein, thereby diffusing light from the light emitting element array incident on the transparent plate so as to emit the light as the illumination light.

133. A linear illumination device according to claim 132, wherein the plurality of regions are a plurality of cavities formed in the transparent plate.

134. A linear illumination device according to claim 133, wherein each of the plurality of cavities has a cylindrical shape having an axis in the sub-scanning direction.

135. A linear illumination device according to claim 133, wherein the transparent plate has a first face adjacent to the light emitting element array and a second face

facing the first face, each of the plurality of cavities has a triangular prism shape having an axis in the sub-scanning direction, one side face of the triangular prism opposes the first face and an edge opposing the side face is closer to the first face than the side face.

136. A linear illumination device for radiating linear illumination light along a first direction onto a document provided so as to oppose to a light emitting element array, comprising:

a substrate extending in the first direction;

the light emitting element array provided on the substrate and arranged in the first direction;

a first transparent plate provided on the light emitting element array, which extends in the first direction; and

a second transparent plate provided on the light emitting element array, which extends in the first direction,

wherein the first direction is parallel to a main scanning direction of the document, and

wherein lengths of the first transparent plate and the second transparent plate in the respective main scanning directions are substantially identical with a length of the light emitting element array, lengths of parts of the first transparent plate and the second transparent plate are substantially identical with a length in the sub-scanning direction of each of the light emitting elements, and a sum of the length of the first transparent plate and the length of the second transparent plate is substantially equal to a distance between the light emitting element array and the document in a direction perpendicular to both the main scanning direc-

tion and the sub-scanning direction.

137. A linear illumination device according to claim 136, wherein the first transparent plate has a first face adjacent to the light emitting element array and a second face opposing to the first face, and the second face is a triangular wave face or a sawtooth face having a predetermined angle and a predetermined pitch.

138. A linear illumination device according to claim 136, wherein the second transparent plate has a first face adjacent to the first transparent plate, and the first plate is a triangular wave face or a sawtooth face having a predetermined angle and a predetermined pitch.

139. A linear illumination device according to claim 137, wherein the second transparent plate has a face adjacent to the first transparent plate and a face opposing thereto, and part of a cross-section along the sub-scanning direction of the second transparent plate, corresponding to the opposing face is a curved face.

140. A linear illumination device according to claim 138, wherein the second transparent plate has a second face opposing to the first face, and part of a cross-section along the sub-scanning direction of the second transparent plate, corresponding to the second face is a curved face.

141. A linear illumination device according to claim 137, wherein a length of at least one of the first transparent plate and the second transparent plate in the sub-scanning direction decreases as moving away from the

light emitting elements.

142. A linear illumination device according to claim 138, wherein a length of at least one of the first transparent plate and the second transparent plate in the sub-scanning direction decreases as moving away from the light emitting elements.

143. A linear illumination device according to claim 137, wherein the second transparent plate has a face adjacent to the first transparent plate and a face opposing thereto, and the opposing face is inclined with respect to the sub-scanning direction.

144. A linear illumination device according to claim 143, wherein the second transparent plate has a second face opposing to the first face, and the second face is inclined with respect to the sub-scanning direction.

145. A linear illumination device according to claim 137, wherein at least one of the first transparent plate and the second transparent plate includes a plurality of regions having a different refractive index from that of a periphery thereof therein, thereby diffusing light from the light emitting element array incident on the at least one of the first transparent plate and the second transparent plate so as to emit the light as the illumination light.

146. A linear illumination device according to claim 145, wherein the plurality of regions are a plurality of cavities formed in the at least one of the first transparent plate and the second transparent plate.

147. A linear illumination device according to claim 146, wherein each of the plurality of cavities has a cylindrical shape having an axis in the sub-scanning direction.

148. A linear illumination device according to claim 147, wherein each of the plurality of cavities has a triangular prism shape having an axis in the sub-scanning direction, one side face of the triangular prism opposes to the first face, and an edge opposing the side face is closer to the first face than the side face.

149. A linear illumination device according to claim 138, wherein at least one of the first transparent plate and the second transparent plate includes a plurality of regions having a different refractive index from that of a periphery thereof therein, thereby diffusing light from the light emitting element array incident on the at least one of the first transparent plate and the second transparent plate so as to emit the light as the illumination light.

150. A linear illumination device according to claim 149, wherein the plurality of regions are a plurality of cavities formed in the at least one of the first transparent plate and the second transparent plate.

151. A linear illumination device according to claim 150, wherein each of the plurality of cavities has a cylindrical shape having an axis in the sub-scanning direction.

152. A linear illumination device according to claim 150, wherein each of the plurality of cavities has a triangular prism shape having an axis in the sub-scanning

direction, one side face of the triangular prism opposes to the first face, and an edge opposing the side face is closer to the first face than the side face.

153. A linear illumination device according to claim 136, wherein a plurality of concavities are formed on a face of the substrate on which the light emitting array is provided, a bottom face and a side face of each of the concavities are reflective faces or mirror faces, and each of the light emitting elements is provided on the bottom face of a corresponding one of the concavities.